You Can Take It With You

Activity Objective

- To determine how much fluid a person drinks each day

Key Concepts

- Water requirements must be determined for space missions.
- Spacecraft will have to carry all the water a crew needs.
- Recycling processes can purify wastewater.

Background

Astronauts have a limited amount of water available on space missions because of space and weight limitations for water storage aboard spacecraft. In this activity, students determine the amount of fluid they drink in 24 hours and compare their consumption with that of astronauts in space. To do this, students carry a day's water supply and record how much they use.

Materials

- ✓ Plastic drink bottle with lid (one for each student)
- ✓ Scale

Instructions

1. Students should fill a clean, plastic bottle with drinking water.

2. Students should carry the bottle with them for 24 hours.

3. If a student wants a drink of water, they should take it from the bottle.

4. If a student drinks another liquid, he should pour out an equal amount of water. For example, if a student drinks a 12-ounce bottle of juice, he must pour out 12 ounces (355 ml) of water from his bottle. Use the empty juice bottle to measure the correct amount.

5. Students should refill the bottle only when it is empty. They should be sure to keep track of how many times they refill it.

6. At the end of 24 hours, students should measure the amount of water they have left in the bottle and calculate how much fluid they drank.

Questions

How much fluid did you drink in 24 hours?

When did you drink the most?

List two ways you use water without actually drinking it.

List two things that happen to the water you drink.

Why would astronauts need to conserve water during a space mission?

Why might astronauts need to recycle water on a long trip?

Extension

Space station astronauts will be able to use a total of 6.8 liters (about 1.75 gallons) of water per day for personal hygiene. This is 4.1 liters (about one gallon) for washing hands and face, and 2.7 liters (about.75 gallons) for taking a shower.

Could you live within the NASA limits?

Imagine seven astronauts traveling to Mars on a three-year mission. Why wouldn't they be able to take all of their drinking water?

What water-related recreational activities would you miss if you went into space for an extended period of time?

How much does one liter of water weigh?

How much water did your entire class consume in one day? What was the average amount?

Suppose you had to stockpile a year's worth of drinking water for one person in your class. Based on the average amount of water consumed per person, how much would the supply of water weigh?